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CHEMICAL & ENGINEERING
NEWS

D. Allan Bromley discusses role as Presidential Science Adviser Page 12
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Antarctic Ocean

Fertilization might cut carbon dioxide level in atmosphere
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CHEMICAL & ENGINEERING
NEWS
JULY 2, 1990

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■ **National Academy of Sciences conference, held last week in Washington, D.C., addresses crisis in biomedical research funding.** Page 4

■ **Union launches campaign to establish new set of reforms for chemical plant safety.** Page 5

■ **ACS gets 45-day extension for filing initial response to Dialog antitrust lawsuit.** Page 5

■ **FDA approves Soviet arrhythmia drug for marketing in U.S.** Page 5

■ **West German convicted and sentenced for helping Libya build alleged chemical arms plant at Rabta.** Page 6

■ **British firm offers $656 million to acquire ailing Foxboro Co., maker of process control systems.** Page 6

Cover: Photo by Joe Outland/ Uniphoto Picture Agency

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Business

Chemical industry productivity increased slightly in the first quarter, following several quarters of falling or flat productivity indexes. **Page 9**

Asbestos may pose a risk to another group of workers—building custodians, building renovators or demolishers, and plumbers. **Page 10**

Government

D. Allan Bromley discusses the issues and responsibilities associated with being the President's science adviser. **Page 12**

EPA responds to criticism of its chemical testing program by initiating moves to give it higher priority. **Page 18**

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People

Herman Bloch, long active in ACS governance activities and former ACS Board chairman, is dead at 78. **Page 36**

Science/Technology

Concept of fertilizing oceans with iron to increase phytoplankton population and thus uptake of atmospheric CO_2 provokes debate, draws gamut of reactions. **Page 21**

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LETTERS

CHEMICAL SAFETY

Gas occlusion with metals

SIR: William B. Lutz reported (C&EN, May 14, page 2) that when silver was melted in a muffle furnace and poured into a small amount of water an explosion ensued which he attributes to rapid conversion of water to steam by the hot silver.

Probably more to the point is the interaction described in the following quotation from F. E. Matthews [*Encyclopaedia Britannica*, 14th ed., 1940]: "In the molten state silver has the property of 'occluding' about 20 times its volume of oxygen. This ... is violently ejected on cooling to near the solidifying point, producing a phenomenon known as the 'spitting' of silver. The absorption of oxygen from the air can be prevented by covering the surface either with powdered charcoal or with some nonoxidizing flux."

Gas occlusion can occur with various metals (e.g., hydrogen by cobalt) and should be thought of as potentially hazardous to safety and also to the validity of chemical and physical determinations.

Albert J. Byer
Jamesburg, N.J.

Paper versus plastic

SIR: With the recent celebration of Earth Day and its attendant hype, many suggestions have been made and some actions have been taken to help the environment. I am not sure if all of these have been thoroughly thought out. It seems that some of these actions may be going from a bad thing to something worse.

One action taken at a nearby major university and one that may happen on our campus is to replace polystyrene foam food containers with paper. On the surface this seems to be a good idea, since paper is "natural," though I have never seen paper cups growing wild.

The three big arguments against plastic foam are that chlorofluorocarbons are used in its production, it is made from nonrenewable petroleum, and it is not biodegradable. I looked into the situation. These arguments may not be valid when compared with paper products.

Recent articles state that manufacturers are switching to [hydrochlorofluorocarbons], which are less damaging, or back to the original blowing agent, pentane, which is better, though it is a greenhouse gas.

I found that a paper cup contains a greater mass of wax than the total mass of a polystyrene cup of equal volume. I understand that this wax is low-molecular-weight polyethylene, but even if it is paraffin, it is still a petroleum product. We also must consider the petroleum and coal used for cutting the trees, transporting the logs to the mill, and pulping the paper. There is also pollution from the papermaking process.

Recent studies show that even the "natural" paper products do not degrade in landfills. This may be fortunate since inks and other potential pollutants will not be released from the paper cup.

From my simple analysis, it seems that, except for the HCFCs, polystyrene appears to be at least as good as paper.

One positive aspect to polystyrene cups, since they contain mostly polystyrene, is that they are recyclable, whereas the paper cups are a heterogeneous mixture, complicating recycling.

Most of my work has been from simple experiments and commonly available sources, without the benefit of an inside view. I ask the readers of C&EN, particularly those in the two industries involved, to give us a full analysis of pollution and energy use in the making and marketing of these products from source to disposal. Then we can make an informed choice, rather than having to base our decisions upon partial information. The current situation often leads people to respond to environmental problems with emotional knee-jerk reactions, which may often be incorrect.

I feel that a responsible reporting of the relative merits in this and other situations would do much to help improve the image of chemistry and chemists. I also feel that this type of analysis should be done and made available for all products.

Michael Chejlava
William Jewell College
Liberty, Mo.

Priestley Medal address

SIR: I share Roald Hoffmann's concern expressed in his Priestley Medal address (C&EN, April 23, page 25) about the still rampant spread of chemophobia, and the lack of the public's technical knowledge also mentioned in his previously published remarks (C&EN, Jan. 29, page 28).

I, too, ask why showbiz celebrities like

Chemical Productivity Rose in First Quarter

Productivity in the chemical industry, that nebulous measure of industry health in managing people and ultimately in competitiveness, rose slightly in the first quarter. This rise comes after six quarters of falling or flat productivity indexes.

As chemical industry output slows, it is to be expected that managers will be slower in terms of controlling employment levels. And this time around, this does continue to be the case—at least for the broad chemicals and allied products category. However, they may have caught up to the situation, matching employment levels with the work to be performed.

Granted, if one were able to divine productivity in some of the subgroups of chemicals and allied products—especially some commodity industrial chemicals—one might find a different picture. Overall, however, productivity is up on both a quarter-to-quarter and a year-to-year basis.

Using production data from the Federal Reserve Board and employment figures from the Labor Department, C&EN estimates that labor productivity for the chemical industry in the first quarter increased 1.2% over the fourth quarter of 1989. Productivity is defined as output per hour of production, calculated by dividing the government's index for production by the index for aggregate hours of production. In the fourth quarter of last year, productivity had declined 0.4% from the previous three months.

The first-quarter increase came on both an increase in production and a modest decline in workhours. Chemical output for the quarter showed an average increase of about 1.0% over the prior three months and workhours fell a slight 0.2% during the period.

On a year-to-year basis, production was up 2.1% from the first quarter of 1989, and workhours, while increasing, rose only 1.7% from the same three-month period in 1989. The result was that productivity increased 3.0% in the first quarter from the same period 12 months earlier. In the fourth quarter, chemical labor productivity had been down 1.0% from the same period a year earlier.

By way of contrast, chemical productivity growth was equal to that of all manufacturing on a quarter-to-quarter basis in the first three-month period this year, but was slightly behind when compared with the year-earlier quarter. Labor productivity for all manufacturing was up 1.2% for the first quarter from the final three months of 1989 and up 3.2% from the same period a year earlier.

Chemical unit labor costs also reversed a five-quarter trend in the first three months of this year by falling 1.2% from the fourth quarter of 1989, although this measure is still 2.5% above the year-earlier quarter. Unit labor costs are labor costs per unit of output, calculated by dividing indexes for hourly wages by indexes for output per workhour or productivity. In the fourth quarter, unit labor costs for chemicals and allied products were up 1.5% from the previous three months and up a hefty 4.2% from the same period a year earlier.

The improvement in unit labor costs on a quarter-to-quarter basis in the early part of this year was almost solely the result of the improvement in productivity. While this was increasing 3.0%, hourly production wages were essentially flat, falling a slight 0.1%.

For all manufacturing, unit labor costs were down 0.6% in the first quarter both from the previous three months and from the year-earlier quarter. In the fourth quarter, they had been flat from the July to October period of 1989, but up a meager 0.4% from the fourth quarter the year before.

The improvement in unit labor costs for all manufacturing in the first quarter from the previous three months came mainly from the 1.2% growth in productivity. Hourly production wages in the same period rose 0.7%.

William Storck

Chemical productivity has been relatively flat

	Quarter, 1990	Quarters, 1989				Quarters, 1988			
Indexes, 1987 = 100	1st	4th	3rd	2nd	1st	4th	3rd	2nd	1st
CHEMICALS & ALLIED PRODUCTS									
Production	110.0	108.9	108.9	108.3	107.7	107.1	107.5	104.5	102.4
Workhours	107.5	107.7	107.3	106.7	105.7	104.9	104.0	103.2	102.5
Productivity	102.3	101.1	101.5	101.5	101.9	102.1	103.3	101.3	99.9
Hourly production wages	107.2	107.3	106.1	104.8	104.1	103.9	102.6	101.7	101.3
Unit labor costs	104.8	106.1	104.5	103.3	102.2	101.8	99.3	100.4	101.4
ALL MANUFACTURING									
Production	109.2	108.7	108.9	109.3	108.6	107.7	106.7	105.1	103.7
Workhours	101.0	101.8	103.2	103.7	103.8	103.3	102.7	102.3	101.6
Productivity	108.1	106.8	105.6	105.4	104.7	104.3	103.9	102.7	102.1
Hourly production wages	107.6	106.9	105.8	105.2	104.8	104.0	102.8	102.4	101.8
Unit labor costs	99.5	100.1	100.2	99.9	100.1	99.7	98.9	99.7	99.5

Note: Productivity is output per workhour, calculated by dividing production index by index for aggregate weekly hours of production. Unit labor costs are costs per unit of output, calculated by dividing index for hourly production wages by that for output per workhour. **Sources:** Federal Reserve Board, Department of Labor, C&EN estimates